

REMARKS

Claims 9, 10, 21, and 22 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 3,979,010 to Fiedler et al. ("Fiedler"). All remaining claims, namely claims 5-8, 11-13, 18-20 and 23-25, have been rejected under 35 U.S.C. §103 as being obvious over Fiedler in view of U.S. Patent No. 5,606,954 to Yamazaki et al. ("Yamazaki"). In response to these rejections, Applicants amended claims 9 and 21, and submit that all rejections under § 102(b) have been overcome as explained below. Applicants respectfully traverse all other rejections under § 103 as detailed below.

§ 102(b) Rejections

Claim 9, as amended, recites a funnel having an inlet port configured to receive a nozzle from an external fuel source, a fuel filler tube coupled to an outlet port of the funnel, and a vapor recirculation tube coupled to the funnel, wherein, in a plane perpendicular to a longitudinal axis of the funnel, the fuel vapor entering the funnel from the vapor recirculation tube is directed at a first angle less than 90° from a line tangent to the inner surface of the funnel at a point where the fuel vapor enters the funnel to introduce a swirl component in the fuel vapor around the inner surface of the funnel, which creates a low pressure region in the funnel to reduce the amount of fuel vapor that escapes the fuel fill system.

Applicants respectfully submit that Fiedler does not teach or disclose that the vapor entering the funnel from the vapor recirculation tube can flow around the inside surface of the funnel to introduce a swirl component in the fuel vapor, which creates a low pressure region in the funnel to reduce the amount of fuel vapor that escapes the fuel fill system. Instead, Fiedler shows, in Figs. 2 and 3, a vent tube (9) pointing the fuel vapor at a plate-like sheet-like metal support member (11) that extends across the entire width of the funnel (2), which will stop the flow of vapor from the vent tube (9) from flowing around the inside surface of the funnel (2). Thus, the plate-like sheet-like metal support member (11) prevents the formation of a swirl component in the fuel vapor within the funnel (2), thus *no* low pressure region will form within Fiedler's funnel (2).

In rejecting claim 9 the Examiner states that the vapor recirculation tube (9) of Fiedler is attached to a "cylindrical portion" of the funnel (2). Applicants respectfully point out, however, that claim 9 *does not* contain any limitation that the vapor circulation tube be attached to a cylindrical portion of the funnel. Even if claim 9 had such a limitation, the Examiner's statement that the vapor recirculation tube (9) of Fiedler is attached to a "cylindrical portion" of the funnel (2), is incorrect. In Fiedler, the specification (col. 3, line 27-29) states that "the vent pipe 9 terminates in the *rear, inclined section 4*" of the funnel (2) (*See* FIG. 3), not in the cylindrical portion. Applicants respectfully disagree with the Examiner's characterization of the Fiedler application.

Claim 10 depends from claim 9, and is therefore patentable for at least the reasons stated above.

Claim 21, as amended, recites an inlet port configured to receive a nozzle from an external fuel source, an outlet port through which fuel from the nozzle passes to a fuel filler tube, and a fuel vapor port configured to direct fuel vapor entering the funnel at a first angle less than 90° from a line tangent to an inner surface of the funnel at a point where the fuel vapor enters the funnel, the angle being in a plane perpendicular to a longitudinal axis of the funnel to introduce a swirl component in the fuel vapor around the inner surface of the funnel, which creates a low pressure region in the funnel to reduce the amount of fuel vapor that escapes the fuel fill system.

With respect to claim 21, Applicants respectfully submit that claim 21 is not anticipated by Fiedler for at least the reasons stated above regarding claim 9 as applied here to a fuel vapor port.

Claim 22 depends from claim 21 and is therefore not anticipated for at least the reasons stated above.

§ 103 Rejections

The Examiner rejects claims 5-8, 11-13, 18-20 and 23-25 under § 103 as being obvious over Fiedler in view of Yamazaki. Applicants traverse the Examiner's rejections and respectfully submit that the Examiner has relied on impermissible hindsight to make the identified combination. The Examiner contends that "it would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ Fiedler et al. a fuel vapor port, at

the end of vapor recirculation tube 9 which is connected to funnel 2, so located such that fuel vapor is directed toward to the outlet of the funnel for purposes of conducting fuel vapor exhausted from the fuel tank during refueling into the filler neck to be entrained by, and mixed with, the liquid fuel entering the fuel funnel for return to the fuel tank precluding potentially hazardous fuel vapor leakage to the atmosphere as recognized by Yamazaki et al." Applicants respectfully disagree.

Fiedler does not teach a recirculation tube for keeping the fuel vapor within the fuel filling system, but instead teaches a venting pipe (9) that allows the fuel vapor to escape therefrom. A vent is defined as a means of escape or release from confinement, or an opening permitting the escape of fumes. Webster's New Twentieth Century Dictionary, 2027 (Jean L. McKechnie, 2d ed., William Collins 1979). Note the use of the word escape in the definition and in the Fiedler specification at column 1, line 29 and column 3, line 38.

Fiedler discloses a vent pipe (9) pointing toward the inlet portion of the funnel *to allow air* (vapors from inside the fuel tank) *to escape* during fueling to prevent liquid fuel from backing up in the tubes below the outlet port of the funnel and as a result activating the automatic shut off switch inside the fueling nozzle (column 1, lines 27-30, 49-54). The vent pipe (9) enters the funnel shortly in front of a plate-like sheet metal support member (11); however, the support member "leaves free sufficiently large openings for the passage of the air which in particular flows through the vent pipe (9)" toward the inlet port (column 2, lines 8-11).

Yamazaki, in Figure 9, teaches both a vent tube (55) and a recirculation tube (27₃). The vent tube (55) is located above the fuel nozzle and is separated from the liquid fuel by a shutter (57). The recirculation tube (27₃) is position below the shutter (57), is contained in the portion of the funnel with the incoming liquid fuel, and is angled toward the outlet portion of the funnel. One of ordinary skill in the art at the time of the invention may have been motivated to look at Fielder's vent tube (9) and Yamazaki's vent tube (55) for a possible combination, but would not have been motivated to combine the Fiedler vent tube (9), which has nothing to do with re-circulating fuel vapor, with Yamazaki's recirculation tube (27₃). To do so would have destroyed the functionality of the Fielder vent tube. Therefore, by its very nature the Fiedler reference teaches away from the Examiner's proposed combination.

Each of the rejected claims, including independent claims 5 and 18, are directed to a fuel fill system in which fuel vapor is directed at an angle in the funnel to generate a swirl component. Although, Fiedler may teach creating a vortex within the incoming liquid fuel as a result of the placement of the fuel nozzle, Fiedler does not teach creating a vortex or a swirl component within the fuel vapor contained inside the funnel. As explained above, Fiedler's support member (11) will actually prevent the fuel vapor from being directed around the inner surface of the funnel in a swirl component.

According to the Examiner, Yamazaki teaches the use of a vapor recirculation tube (27₃) or a vapor port directed toward the outlet of the funnel "for the purpose of conducting fuel vapor exhausted from the fuel tank during refueling into the filler neck to be entrained by, and mixed with, the liquid fuel entering the fuel funnel for return to the fuel tank." Yamazaki does not teach, however, that the tube or port being directed toward the outlet will result in a swirl component of the fuel vapor within the funnel. Since neither Fiedler nor Yamazaki teach creating a swirl component within the fuel vapor inside the funnel, there was no motivation to combine these prior art references by one of ordinary skill in the art at the time of the invention to create a swirl component.

Typographical Correction


Applicants respectfully submit that claim 18 is being amended to correct a clear typographical error. The preamble of claim 18 previously recited a "funnel for a fuel *full* system," but as currently amended recites a "funnel for a fuel *fill* system." Applicants request such correction be made.

In light of the above arguments, Applicants submit that each pending claim of the application is patentable over the cited art. Accordingly, the application is believed to be in a condition for allowance, and a formal notice thereof is respectfully solicited.

The applicant(s) hereby authorizes the Commissioner under 37 C.F.R. §1.136(a)(3) to treat any paper that is filed in this application which requires an extension of time as incorporating a request for such an extension. The Commissioner is authorized to charge any additional fees required by this paper or to credit any overpayment to Deposit Account No. 20-0809.

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Page 10 of 10

Respectfully submitted,



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